In the claims:

Please cancel claims 42 and 44.

1. (Original) An apparatus for use in chemical mechanical polishing a substrate, comprising:

a first optical system including a first light source to generate a first light beam to impinge on the substrate, the first light beam having a first effective wavelength, and a first sensor to measure light from the first light beam that is reflected from the substrate to generate a first signal;

B1

a second optical system including a second light source to generate a second light beam that impinges the substrate, the second light beam having a second effective wavelength which differs from the first effective wavelength, and a second sensor to measure light from the second light beam that is reflected from the substrate to generate a second signal; and

a processor configured to determine a polishing endpoint from the first and second signals.

2. (Original) The apparatus of claim 1, wherein the first and second light beams have different wavelengths.

3. (Original) The apparatus of claim 1, wherein the first and second light beams have different incidence angles on the substrate.

4. (Original) The apparatus of claim 3, wherein the first and second light beams have different wavelengths.

5. (Original) The apparatus of claim 1, wherein the first effective wavelength is greater than the second effective wavelength.

6. (Original) The apparatus of claim 5, wherein the first effective wavelength is not an integer multiple of the second effective wavelength.

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7. (Original) The apparatus of claim 1, wherein at least one of the optical systems is an off-axis optical system.

8. (Original) The apparatus of claim 7, wherein both the first and second optical systems are off-axis optical systems.

9. (Original) The apparatus of claim 7, wherein the first optical system is an off-axis optical system and the second optical system is a normal-axis optical system.

B1

10. (Original) The apparatus of claim 1, wherein at least one of the optical systems is a normal-axis optical system.

11. (Original) The apparatus of claim 1, wherein at least one of the first and second light sources is a light emitting diode.

12. (Original) The apparatus of claim 11, wherein the first light source is a first light emitting diode having a first coherence length and the second light source is a second light emitting diode having a second coherence length.

13. (Original) The apparatus of claim 12, wherein the first coherence length is greater than a optical path length of the first light beam through a layer in the substrate, and the second coherence length is greater than an optical path length of the second light beam through the layer in the substrate.

14. (Original) The apparatus of claim 1, further comprising a polishing pad which contacts the first surface of the substrate.

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15. (Original) The apparatus of claim 14, further comprising a platen to support the polishing pad, wherein the platen includes an aperture, and the first and second light beams pass through the aperture.

16. (Original) The apparatus of claim 14, further comprising a platen to support the polishing pad, wherein the platen includes a first aperture and a second aperture, and the first light beam passes through the first aperture and the second light beam passes through the second aperture.

B1

17. (Original) The apparatus of claim 14, wherein the polishing pad includes a transparent window, and the first and second light beams pass through the window.

18. (Original) The apparatus of claim 14, wherein the polishing pad includes a first transparent window and a second transparent window, and the first light beam passes through the first window and the second light beam passes through the second window.

19. (Original) The apparatus of claim 1, wherein the first effective wavelength is greater than the second effective wavelength.

20. (Original) The apparatus of claim 19, wherein the first light beam has a first wavelength and the second light beam has a second wavelength that is shorter than the first wavelength.

21. (Original) The apparatus of claim 20, wherein the first wavelength is between about 600 and 1500 nanometers.

22. (Original) The apparatus of claim 20, wherein the second wavelength is between about 300 and 600 nanometers.

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23. (Original) The apparatus of claim 19, wherein the first light beam has an incidence angle on the substrate that is less than a second incidence angle of the second light beam on the substrate.

~~34.~~ 24 (Original) An apparatus for use in chemical mechanical polishing a substrate having a first surface and a second surface underlying the first surface, comprising:

a first optical system including a first light source to generate a first light beam to impinge on the substrate, the first light beam having a first effective wavelength, and a first sensor to measure light from the first light beam that is reflected from the first and second surfaces to generate a first interference signal; and

B1

a second optical system including a second light source to generate a second light beam that impinges the substrate, the second light beam having a second effective wavelength which differs from the first effective wavelength, and a second sensor to measure light from the second light beam that is reflected from the first and second surfaces to generate a second interference signal.

~~36.~~ 25 (Original) An apparatus for use in chemical mechanical polishing a substrate, comprising:

a first optical system including a first light emitting diode to generate a first light beam that impinges the substrate, the first light beam having a first effective wavelength, and a first sensor to measure light from the first light beam that is reflected from the substrate to generate a first signal; and

a second optical system including a second light emitting diode to generate a second light beam that impinges the substrate, the second light beam having a second effective wavelength that differs from the first effective wavelength, and a second sensor to measure light from the second light beam that is reflected from the substrate to generate a second signal.

~~37.~~ 26 (Original) The apparatus of claim ~~36~~ 25, wherein the first light beam has a first wavelength and the second light beam has a second wavelength that is shorter than the first wavelength.

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~~38.~~ 27 (Original) The apparatus of claim ~~37~~ 26, wherein the first wavelength is between about 700 and 1500 nanometers.

~~39.~~ 28 (Original) The apparatus of claim ~~37~~ 24, wherein the second wavelength is between about 300 and 700 nanometers.

B1

~~40.~~ 29 (Original) The apparatus of claim ~~36~~ 25, wherein the substrate has a layer in a thin film structure disposed over a wafer, and wherein the first and second light beams have coherence lengths sufficiently large to maintain coherence of the first and second light beams as they pass through the layer.

~~41.~~ 30 (Original) The apparatus of claim ~~40~~ 29, wherein a first coherence length of the first beam is greater than an optical path length of the first light beam through the layer, and a second coherence length of the second light beam is greater than an optical path length of the second light beam through the layer.

42. (Canceled)

~~43.~~ 31 (Original) An apparatus for detecting a polishing endpoint during chemical mechanical polishing of a substrate, comprising:

a first optical system including a first light source to generate a first light beam having a first effective wavelength that impinges the substrate, and a first sensor to measure light from the first light beam that is reflected from the substrate to generate a first signal; and

a second optical system including a second light source to generate a second light beam that impinges the substrate, the second light beam having a second effective wavelength that differs from the first effective wavelength, and a second sensor to measure light from the second light beam that is reflected from the substrate to generate a second signal; and

a processor configured to combine the first and second signals and detect the polishing endpoint.

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44. (Canceled)

32 ~~45~~. (Original) A method of determining a layer thickness for a substrate undergoing chemical mechanical polishing, comprising:

generating a first signal by directing a first light beam having a first effective wavelength onto the substrate and measuring light from the first light beam reflected from the substrate with a first detector;

B1

generating a second signal by directing a second light beam having a second effective wavelength onto the substrate and measuring light from the second light beam reflected from the substrate with a second detector, wherein the first effective wavelength differs from the second effective wavelength; and

determining the polishing endpoint from the first and second interference signals.

33 ~~55~~. (Original) The method of claim 32 ~~45~~, wherein the first and second light beams have different wavelengths.

34 ~~56~~. (Original) The method of claim 32 ~~45~~, wherein the first and second light beams have different incidence angles on the substrate.

35 ~~57~~. (Original) The method of claim 34 ~~56~~, wherein the first and second light beams have different wavelengths.

36 ~~58~~. (Original) A method of detecting a polishing endpoint during polishing of a substrate, comprising:

generating a first signal by directing a first light beam having a first effective wavelength onto the substrate and measuring light from the first light beam reflected from the substrate;

generating a second signal by directing a second light beam having a second effective wavelength onto the substrate and measuring light from the second light beam reflected from the

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B1

substrate, wherein the first effective wavelength differs from the second effective wavelength; and

combining the first and second signals to determine a polishing endpoint.

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